CLAIMS

1. A projection aligner for projecting a mask pattern for fabrication of a semiconductor device onto a substrate, said projection aligner comprising:

a reflectance measuring mechanism for irradiating a substrate with exposure light and measuring a reflectance of said exposure light from said substrate; and

a control mechanism for adjusting an intensity of said exposure light to a predetermined intensity by referring to said measured reflectance.

2. The projection aligner according to claim 1, wherein said reflectance measuring mechanism includes:

an adjuster capable of adjusting an intensity of exposure light used for measurement of a reflectance; and

a reflectance detector for measuring a reflectance of said exposure light from said substrate.

3. The projection aligner according to claim 1, wherein said reflectance measuring mechanism includes:

an adjuster capable of adjusting an intensity of exposure light used for measurement of a reflectance; and

a beam splitter for branching said exposure light used for measurement of a reflectance, into two light beams; and

two reflectance detectors each corresponding to a respective one of said two light beams.

4. The projection aligner according to claim 1, wherein said reflectance measuring mechanism includes a branching system for branching a portion of exposure light emitted from an exposure light source; and

wherein a position at which a reflectance is to be measured is selected in an area immediately before an exposure

area on said substrate.

5. The projection aligner according to claim 1, wherein said reflectance measuring mechanism includes an optical system for forming exposure light used for measurement of a reflectance, into a beam of a predetermined shape.

6. The projection aligner according to claim 1, wherein said control mechanism includes a determining system for determining an intensity of appropriate exposure light from said measured reflectance based on data indicating relationships between reflectances and intensities of appropriate exposure light.

7. The projection aligner according to claim 1, wherein said control mechanism includes a changing system for changing illumination of an illumination system which provides exposure light.

8. The projection aligner according to claim 1, further comprising a pulse light source as an exposure light source;

wherein said control mechanism includes a changing system for changing an interval between pulse light emissions.

9. The projection aligner according to claim 1, wherein said control mechanism includes a changing system for changing a scan speed of a stage for moving a substrate against exposure light.

10. A projection exposure method comprising:

a first step of, from an exposure light source, irradiating a substrate with exposure light, and measuring a reflectance of said exposure light from said substrate; and

a second step of determining an appropriate intensity of

exposure light for said substrate based on said reflectance, and then projecting a mask pattern onto said substrate by irradiating with exposure light of said determined intensity.

11. The projection exposure method according to claim 10, wherein said first step irradiates an exposure area of a substrate with exposure light beforehand and measures a reflectance of said exposure light from said substrate, said exposure light having energy lower than that of exposure light at a time of a projection exposure.

12. The projection exposure method according to claim 10, wherein said first step includes steps of:

branching a portion of exposure light from an exposure light source at a time of projecting a mask pattern onto an exposure area;

irradiating an area adjacent to said exposure area of said substrate with said branched light; and

measuring a reflectance of said branched light from said substrate.

13. The projection exposure method according to claim 10, wherein said first step includes steps of:

branching a portion of exposure light from an exposure light source at a time of projecting a mask pattern onto an exposure area;

irradiating an area immediately before said exposure area of said substrate with said branched light; and

measuring a reflectance of said branched light from said substrate.

14. The projection exposure method according to claim 10, wherein said first step includes steps of:

forming a portion of exposure light from an exposure

light source into a beam of a predetermined shape by use of an optical system;

irradiating a substrate with said beam; and

measuring a reflectance of said beam from said substrate.

15. The projection exposure method according to claim 10, wherein said first step includes steps of:

branching a portion of exposure light from an exposure light source;

branching said branched light into two light beams; and

measuring a reflectance of a branched light beam selected from said two branched light beams, said selected branched light beam illuminating an area which is immediately before an exposure area and is determined based on a moving direction of a substrate.

16. The projection exposure method according to claim 1, wherein said second step includes steps of:

preparing data indicating relationships between reflectances of a substrate and appropriate intensities of exposure light; and

determining an appropriate intensity of exposure light at a time of an exposure by referring to said data based on reflectance measuring results.

17. The projection exposure method according to claim 10, wherein, in said second step, said substrate is irradiated with exposure light of said appropriate intensity by changing illumination of said exposure light.

18. The projection exposure method as claimed in any one of claims 10 to 16, wherein, in said second step, said substrate is irradiated with exposure light of said appropriate intensity by changing an interval between pulse

light emissions of said exposure light.

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19. The projection exposure method according to claim 10, wherein, in said second step, said substrate is irradiated with exposure light of said appropriate intensity by adjusting a scan speed of a wafer stage on which said substrate is mounted.

20. A semiconductor device fabricated by use of the projection exposure method according to claims 10.

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